



Robinow syndrome

Robinow syndrome is a rare disorder that affects the development of many parts of the body, particularly the bones. Researchers have identified two major types of Robinow syndrome. The types are distinguished by the severity of their signs and symptoms and by their pattern of inheritance, autosomal recessive or autosomal dominant.

Autosomal recessive Robinow syndrome is characterized by skeletal abnormalities including shortening of the long bones in the arms and legs, particularly the forearms; abnormally short fingers and toes (brachydactyly); wedge-shaped spinal bones (hemivertebrae) leading to an abnormal curvature of the spine (kyphoscoliosis); fused or missing ribs; and short stature. Affected individuals also have distinctive facial features, such as a broad forehead, prominent and widely spaced eyes, a short nose with an upturned tip, a wide nasal bridge, and a broad and triangle-shaped mouth. Together, these facial features are sometimes described as "fetal facies" because they resemble the facial structure of a developing fetus. Other common features of autosomal recessive Robinow syndrome include underdeveloped genitalia in both males and females, and dental problems such as crowded teeth and overgrowth of the gums. Kidney and heart defects are also possible. Delayed development occurs in 10 to 15 percent of people with this condition, although intelligence is usually normal.

Autosomal dominant Robinow syndrome has signs and symptoms that are similar to, but tend to be milder than, those of the autosomal recessive form. Abnormalities of the spine and ribs are rarely seen in the autosomal dominant form, and short stature is less pronounced. A variant form of autosomal dominant Robinow syndrome features increased bone mineral density (osteosclerosis) in addition to the signs and symptoms listed above. This variant is called the osteosclerotic form of Robinow syndrome.

Frequency

Both the autosomal recessive and autosomal dominant forms of Robinow syndrome are rare.

Fewer than 200 people with autosomal recessive Robinow syndrome have been described in the medical literature. This form of the condition has been identified in families from several countries, including Turkey, Oman, Pakistan, and Brazil.

Autosomal dominant Robinow syndrome has been diagnosed in fewer than 50 families; about 10 of these families have had the osteosclerotic form.

Genetic Changes

Autosomal recessive Robinow syndrome results from mutations in the *ROR2* gene. This gene provides instructions for making a protein whose function is not well understood, although it is involved in chemical signaling pathways that are essential for normal development before birth. In particular, the ROR2 protein appears to play a critical role in the formation of the skeleton, heart, and genitals. Mutations in the *ROR2* gene prevent cells from making any functional ROR2 protein, which disrupts development starting before birth and leads to the characteristic features of Robinow syndrome.

Autosomal dominant Robinow syndrome can be caused by mutations in the *WNT5A* or *DVL1* gene, with the osteosclerotic form of the condition resulting from *DVL1* gene mutations. The proteins produced from these genes appear to be part of the same chemical signaling pathways as the ROR2 protein. Mutations in either of these genes alter the production or function of their respective proteins, which impairs chemical signaling that is important for early development.

Some people with the characteristic signs and symptoms of Robinow syndrome do not have an identified mutation in the *ROR2*, *WNT5A*, or *DVL1* gene. In these cases, the cause of the condition is unknown.

Inheritance Pattern

As discussed above, Robinow syndrome can have either an autosomal recessive or an autosomal dominant pattern of inheritance.

Autosomal recessive inheritance means both copies of the gene in each cell have mutations. The parents of an individual with an autosomal recessive condition each carry one copy of the mutated gene, but they typically do not show signs and symptoms of the condition.

Autosomal dominant inheritance means one copy of an altered gene in each cell is sufficient to cause the disorder. In some cases of Robinow syndrome, an affected person inherits the mutation from one affected parent. Other cases result from new mutations in the gene and occur in people with no history of the disorder in their family.

Other Names for This Condition

- acral dysostosis with facial and genital abnormalities
- fetal face syndrome
- mesomelic dwarfism-small genitalia syndrome
- Robinow dwarfism
- Robinow-Silverman-Smith syndrome

- Robinow-Silverman syndrome
- Robinow's syndrome

Diagnosis & Management

These resources address the diagnosis or management of Robinow syndrome:

- GeneReview: Autosomal Dominant Robinow Syndrome
<https://www.ncbi.nlm.nih.gov/books/NBK268648>
- GeneReview: ROR2-Related Robinow Syndrome
<https://www.ncbi.nlm.nih.gov/books/NBK1240>
- Genetic Testing Registry: Robinow syndrome
<https://www.ncbi.nlm.nih.gov/gtr/conditions/C0265205/>
- University of Chicago: Genetic Testing for Robinow Syndrome
<http://dnatesting.uchicago.edu/taxonomy/term/122/all>

These resources from MedlinePlus offer information about the diagnosis and management of various health conditions:

- Diagnostic Tests
<https://medlineplus.gov/diagnostictests.html>
- Drug Therapy
<https://medlineplus.gov/drugtherapy.html>
- Surgery and Rehabilitation
<https://medlineplus.gov/surgeryandrehabilitation.html>
- Genetic Counseling
<https://medlineplus.gov/geneticcounseling.html>
- Palliative Care
<https://medlineplus.gov/palliativecare.html>

Additional Information & Resources

MedlinePlus

- Encyclopedia: Increased Head Circumference
<https://medlineplus.gov/ency/article/003305.htm>
- Health Topic: Craniofacial Abnormalities
<https://medlineplus.gov/craniofacialabnormalities.html>
- Health Topic: Dwarfism
<https://medlineplus.gov/dwarfism.html>

Genetic and Rare Diseases Information Center

- Robinow syndrome
<https://rarediseases.info.nih.gov/diseases/312/robinow-syndrome>

Educational Resources

- Disease InfoSearch: Robinow syndrome
<http://www.diseaseinfosearch.org/Robinow+syndrome/9258>
- Disease InfoSearch: Robinow syndrome autosomal dominant
<http://www.diseaseinfosearch.org/Robinow+syndrome+autosomal+dominant/6345>
- Disease InfoSearch: Robinow syndrome autosomal recessive
<http://www.diseaseinfosearch.org/Robinow+syndrome+autosomal+recessive/6346>
- MalaCards: robinow syndrome
http://www.malacards.org/card/robinow_syndrome
- Orphanet: Autosomal dominant Robinow syndrome
http://www.orpha.net/consor/cgi-bin/OC_Exp.php?Lng=EN&Expert=3107
- Orphanet: Autosomal recessive Robinow syndrome
http://www.orpha.net/consor/cgi-bin/OC_Exp.php?Lng=EN&Expert=1507
- Orphanet: Robinow syndrome
http://www.orpha.net/consor/cgi-bin/OC_Exp.php?Lng=EN&Expert=97360

Patient Support and Advocacy Resources

- Children's Craniofacial Association
<http://www.ccakids.com/>
- Human Growth Foundation
<http://hgfound.org/>
- Little People of America
<http://www.lpaonline.org/>
- National Organization for Rare Disorders (NORD)
<http://rarediseases.org/rare-diseases/robinow-syndrome/>
- Resource List from the University of Kansas Medical Center
<http://www.kumc.edu/gec/support/robinow.html>
- The MAGIC Foundation
<https://www.magicfoundation.org/>

GeneReviews

- Autosomal Dominant Robinow Syndrome
<https://www.ncbi.nlm.nih.gov/books/NBK268648>
- ROR2-Related Robinow Syndrome
<https://www.ncbi.nlm.nih.gov/books/NBK1240>

Genetic Testing Registry

- Robinow syndrome
<https://www.ncbi.nlm.nih.gov/gtr/conditions/C0265205/>
- Robinow syndrome, autosomal dominant 2
<https://www.ncbi.nlm.nih.gov/gtr/conditions/CN229715/>
- Robinow syndrome, autosomal recessive
<https://www.ncbi.nlm.nih.gov/gtr/conditions/C1849334/>

Scientific articles on PubMed

- PubMed
<https://www.ncbi.nlm.nih.gov/pubmed?term=%28%28robinow+syndrome%5BTIAB%5D%29+OR+%28fetal+face+syndrome%5BTIAB%5D%29+OR+%28robinow+dwarfism%5BTIAB%5D%29%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+3600+days%22%5Bdp%5D>

OMIM

- ROBINOW SYNDROME, AUTOSOMAL DOMINANT 1
<http://omim.org/entry/180700>
- ROBINOW SYNDROME, AUTOSOMAL DOMINANT 2
<http://omim.org/entry/616331>
- ROBINOW SYNDROME, AUTOSOMAL RECESSIVE
<http://omim.org/entry/268310>

Sources for This Summary

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<https://www.ncbi.nlm.nih.gov/books/NBK268648>
- GeneReview: ROR2-Related Robinow Syndrome
<https://www.ncbi.nlm.nih.gov/books/NBK1240>
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Free article on PubMed Central: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4059519/>
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Free article on PubMed Central: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4385180/>

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Reviewed: September 2015

Published: December 28, 2016

Lister Hill National Center for Biomedical Communications
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National Institutes of Health
Department of Health & Human Services